SC No I hadn't noticed it until until I started changing the lead.

CAP COM OK. I'm going to crank the music up again.

SC OK. Have they got anything at all down there?

CAP COM No. We're on low bit rate right now so it'll be a few minutes before we get another chance to look at it. We'll let you know if he gets any.

CAP COM Music

SC I can't hear it but it sounds like something I'd rather not hear anyway.

END OF TAPE

PAO This is Apollo Control at 118 hours 43 minutes - rather 118 hours 18 minutes and after almost 45 minutes of relatively quiet we've received a call from the spacecraft. We are in communications right now with Bill Anders aboard Apollo 8. We will pick that up from the beginning.

CAP COM Hello Apollo 8. I interrupt this of music to bring you the late evening status report.

SC Good. Wake up.

CAP COM Okay, we are getting ready to have a shift turnover and I wanted to go over a few items before I do. On the midcourse correction number 6, right now that looks like it is at most .3 a foot per second, so there will be no burn for midcourse number 6. Midcourse number 7 is a little larger and will make a decision on that later. Your weather in landing site still reported as being good and the forecast to be about 2000 scattered and 12 000 broken. But the same numbers they gave Frank earlier. Visibility will be about 10 miles, wave height about 4 feet. And I guess there is some scattered thundershowers, like less than 5 percent, you should worry about, 10 to 30 percent maybe at 2000 broken as opposed to scattered. So it looks pretty fair. We have got a -

SC Just my kind of weather.

CAP COM Roger. Got a couple of flight plans things to consider. Now, number 1 at 119 30 minutes. We have got a P52 IMU realignment, which we need to slip in ahead of the P23 sightings. And that will be an option 3 REFSMMAT.

SC Roger.

CAP COM Okay, some of the folks sitting back and looking at the TV business, have some ideas about things they would like to see tried with the filters. And I would like to review what they have here and see what you think about it... next 10 hours you can decide whether or not you think it is worth the effort. Basically they would like to try using a whole different series of filters.

SC ... Hey Ken, got something to write on. Wasn't that P52 at 18:30 or 19:30?

CAP COM 19:30.

SC Ready to copy on TV.

CAP COM Okay, before you copy let me read it all through to you here so you will get the feel for what it is we are talking about. The title of this little epistle is "TV ... and what they want to do is mount the TV camera with the telephoto lens on a bracket in the

CAP COM rendezvous window and take a TV picture of the earth through the red and blue filter, 1 minute per filter. That means red and blue filters individually. Then they would like to take TV picture of the earth through through the red, in that case the 25 alpha filter combined with the polarizing filter. Rotate the polarizing filter through a 360 degree increment, again 1 minute per position. (skip) ... and to go with this, we would like to have Hasselblad pictures - okay, I am standing by.

SC When you were talking about pictures through the polarizing filter, is that the TV pictures through the polarizing filter?

CAP COM That's affirmative. All above were TV.

SC Okay, now the only thing - the only problem here is it is darn near impossible to aim that television camera (skip) ... that he took three men and a boy up here to get the thing pointed in the right direction. And we tried using chewing gum for a sight and everything else and let me tell you that the odds of getting that thing in the earth is pretty small.

CAP COM Okay, I think we weren't too clever in ir ground callout as to how to point the spacecraft. For e thing, I think we can do that a lot better next time now that we have stumbled through it once. I agree with you -

SC It's not the spacecraft, it's not the spacecraft that's hard to point, it's the camera. The bracket has sufficient slump in it that it can take the camera out of field of view when configured through the window. And it took a lot of microadjustments with a lot of coaching from the ground to get the thing in. It was a real tough job, so I think you ought to take all this in mind, if you could possibly use the wide angle, you might be better off.

CAP COM Okay, I understand what you are saying now. I'll run that by the TV guys and see what they have to say about that. In conjunction with the involved, they wanted to take some Hasselblad pictures of the earth through the rendezvous window with the red (skip) window with the red and blue filter and black and white film and then again through the polarizing filter and this is all going to be used as - in order to try and correlate the TV and the regular film photography. So if you think it is a worth-while thing, you would like to give it a try, i'll run this by Jack and the TV cats and see if they would like to get

CAP COM something out of it with the wide angle. And we can talk about it a little later.

SC Okay. Another thing to keep in mind is that we haven't seen the moon - we didn't see all the way out and we rarely see it going back. We haven't seen it once since we left. But we have maneuvered the wrong way from a (skip)

CAP COM Okay. I wanted you to be aware of this and think about it and what its implications to the flight plan might be and I'll run this wide angle and comment about the moon back by and see which subject they think would be most appropriate. Okay, on the EM scroll, Frank wanted us to verify the order that they could expect to see the entry profile and the first profile that comes up is labelled "nonexit number two" and that is the short range high speed entry. The second thing that will come up, is entitled "The 3500 mile" which is also high speed reentry, but it is the one you would use in event we go to the longer entry ranges. (skip) it is probably nice to know that we are not throwing away at the most important time that it is a function of the computer program rather than a so much a function your trajectory being changed.

SC Let me ask you one thing. That's, do you want a cold soak sometime prior to the midcourse correction for 1 hour. Is that what you told me?

CAP COM not really. I think we are looking at that prior to the midcourse correction. It being the time when we would like to check out the water boilers. Now, the cold soak does involve some water boiling too, but that's going to be done right before entry when these things are not going to be very sensitive and if we don't do it in 12 hours, it is not real clear where the cold soak takes place. Or where you turn on the secondary

END OF TAPE

CAPCOM ... The way you turn on the secondary water boiler and looking through the entry checklist tonight we didn't find a place for that.

SC Okay. Is it really clear that you need the cold soak? We kind of figured on sometime prior to sep, bringing up to secondary evap and also after the primary of that point sometime prior to that date on your suggestion.

CAPCOM Okay we thought about doing that like an hour prior to sep but in the presep check while the things we powered down were in the secondary loop. And they won't need to turn - Right. We're doing that to keep our power profile where we want it. And then we're going to be turning it back on sometime prior to entry. And the time to turn it on in entry, of course this is specified. You turn it on as the voltages show they can hack it.

SC Preferably right after separtion.

CAPCOM That sounds like a real good place. Okay, I'm sure we're going to discuss that one a little bit more, Bill. But right now those are the kind of things we're talking about doing. And on the high gain there is still a lot of discussion about as to what exactly what we saw and what it means. And I think it is a little too early to say anything about that one.

SC Roger, I think it's got X-ray eyes.

CAPCOM That's as good a...explanation.

SC Yeah, I think that's what they hashed out on the ground, Ken.

CAPCOM Okay, I think we all agree that we all want to try experimenting with it if we - really don't know what we're looking at.

SC I jotted down some numbers here that I hope will be helpful.

CAPCOM Okay, fine.

SC You know...in the debriefing.

CAPCOM Real fine.

SC I don't like to make it a real big deal because the antenna switching is not hard at all and the (static) ...is required to work if it doesn't work... (static)

CAPCOM Okay, and we're looking at 120 hours, for the next ordered gimbal.

SC Is it my imagination, or do you have the music run?

CAPCOM I'm sorry, say again.

SC Is it my imagination, or do you have the' music running?

CAPCOM I think it's your imagination.

SC Oh, don't let the doctors hear that.

CAPCOM It's too late, he already heard you.

SC I must be getting that detached feeling.

END OF TAPE

PAO This is Apollo Control at 118 hours, 53 minutes. And at the present time our spacecraft is traveling at a speed of 5152 feet per second, at an altitude of 126944 nautical miles. Here in Mission Control we're in the midst of a change of shift. Flight Director Glynn Lunney is coming on to replace Milton Windler. At the present time Bill Anders is the only crewman aboard the spacecraft who is awake at the present time. And he has had the watch for several hours now as Frank Borman and Jim Lovell have apparently been getting some well earned rest. We had a very quiet evening. We did play up some music to the crew, about an hour's worth. And we have - I had a few brief comments from Anders since our last report - will bring you up to date on those. And then standby for any live communication with the spacecraft.

SC Apollo 8.

CAPCOM Go ahead 8.

SC Roger. Just to make sure the urge to get red blue filter shots of the moon haven't crept into this TV test. We had got red blue filter shots of the moon so you need not worry about that.

CAPCOM Okay. I don't think that would throw it away. I think we're trying to come up with something definitive so that post flight will have some real data to compare with - what we do on the ground for future work. I would like to have you go over and take a look at the battery CHARLIE please.

SC I'm on my way. Okay, battery CHARLIE, that's about 36.8.

CAPCOM Okay, 36.8. Thank you.

SC Roger. Also with respect to the TV tests I would think that we could probably get a pretty good handle on the operations just by taking red/blue polarizing shots of the earth independent of the TV. But within the same time range, or at about the same range of the TV last time.

CAPCOM Okay, that's what the second portion of this really is asking that we do this with the hasselblad and again we won't be using the red/blue filters so we have our base line.

SC Taking a picture of the earth with the hasselblad is no big deal because it does swing by the earth now and then. But trying to get the TV and the hasselblad all pointed to the earth at the same time would really be tough.

CAPCOM Roger. I don't that it's that time critical but I'll ask.

PAO And this is Apollo Control. We anticipate that our change of shift press briefing will come at about 6:30 this morning. And that briefing will include Flight Director Milton Windler. At 118 hours, 57 minutes, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control Houston at 119 hours 30 minutes into the flight of Apollo 8. The Apollo 8 spacecraft at this time 125 043 nautical miles away from earth. Our current velocity reading 5202 feet per second. Flight Director Glynn Lunney has brought his Black Team aboard and brought them up with amber lights and gone around the room discussing systems and operational aspects of our mission at this point in time. At present, all systems look good. We've talked with LM Pilot, Bill Anders some since our last report and here is that conversation.

SC This is Apollo 8.

CAP COM Go ahead, 8.

SC ... hold up on the LiOH change about a half an hour. The PCO2 reading is low and we don't want to wake up the CDR. It's right by his feet.

CAP COM ... Apollo 8, Houston.

SC Go Houston.

CAP COM Okay, Bill. We are coming up on the P52 and then the P23 sightings and there is some concern that if we just go directly to P23 attitude that we are liable to overheat quad Charlie. So, we would like to have you maneuver to place the minus X-axis toward the sun now. And I have got some gimbal angles here for you. And if we take it over there and point the minus X at the sun between now and the time we have to start into the alignment, then - the P23 business, we will tend to cold soak Charlie and then we will be able to go through the P23 operations without worrying about the temperatures.

SC Okay, ...

CAP COM Okay. Roll 183.3, pitch 136, decimal 7 yaw 13.5.

SC Right. 183 roll, 137 pitch, 14 yaw.

CAP COM Okay.

SC We worked out up here on Lovell's slide rule and got 183.25 roll. Houston, you wanted to go to this cold soak attitude prior to the P52, did you not.

CAP COM We would like to go to the cold soak attitude now.

SC That was to keep from heating up quad D, was it?

CAP COM Negative. Quad Charlie.

SC Okay.

PAO Apollo Control Houston. As you heard we passed up a cold soak attitude to Bill Anders. As Apollo 8 gets ready to start IMU alignments and cislunar navigation activities, this is to put quad Charlie on the

PAO shady side for a while. It is the same conservative type of approach followed yesterday on quad Alpha. Current quad temperature readings on these are reaction control system quads on the spacecraft, current quad temperature readings on quad A 83 degrees, quad B 70 degrees, quad C 78 degrees and quad D is 74 degrees. And so we continue to monitor at 119 hours 34 minutes and this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo control, Houston, at 120 hours 18 minutes into the flight of Apollo 8. Apollo 8 at the present time 122 637 nautical miles away from Earth. Our current velocity now, 5267 feet per second on Apollo 8 as it returns to Earth. We have had conversation with Apollo 8 and we are going to pick up that conversation now.

CAPCOM Apollo 8, Houston.

SC Hi, Houston, Apollo 8.

CAPCOM Roger, the P23 that is coming up next, we will want to do a water dump as soon as we are through with that P23, but dump down to 30 percent and this ought to be the last dump of the mission. Over.

SC Okay, you think that we will end up generating enough water to fill her up prior to entry.

CAPCOM Affirmative.

SC Okay, we are at that attitude you gave us, so we stopped the roll a little bit short, it was more like 150 degrees roll right now.

CAPCOM Okay, Bill, on that water dump, we expect to have 90 percent.

SC Okay. Houston, Apollo 8, over.

CAPCOM Apollo 8, Houston, over. Apollo 8, Houston, GO.

SC Roger, we are done with the P52 and arranged for the P23, was there any constraint you wanted - for length of time you wanted to stay in that attitude.

CAPCOM Negative, Bill, when you are finished with P23 we will go back into PPC.

SC Okay, we are going to maneuver for P23 now.

CAPCOM Roger, we are watching your tank pressures.

SC Okay, thank you, we will do an optical first and then do the P23.

CAPCOM Okay. Apollo 8, Houston, we are handing over to Madrid in about 15 seconds. Over.

SC Roger, and good morning Jerry or good afternoon or whatever it is.

CAPCOM Good morning, Jim. About 6:30 in the morning. Apollo 8, Houston, how do you read.

SC Loud and clear, how us.

CAPCOM Roger, the same. Apollo 8, Houston.

SC Go ahead, Houston, Apollo 8.

CAPCOM Morning, Frank. Looks like we have lost the transducer on the primary radiator OUT temperature we are showing an off scale high, the rest of the loop looks real fine though, when you get a chance would you take a look at it and see if you're in the same position, over.

APOLLO 8 MISSION COMMENTARY, 12/26/68, GET12018, 710a, 365/2

SC Which one is it?
CAPCOM Primer A, radiator OUT temperature.
SC Ours is showing 100 off scale, also.
CAPCOM Roger.
PAO Apollo control, Houston, as you heard, all three crewmen, Borman, Lovell, and Anders now awake and ready for business. Apollo 8 has completed its platform alignment and as you heard the cislunar star sighting operation has begun, this matching the stars with, now at this phase of the mission, the Earths horizon. Jim Lovell now awake handles these activies, following P23 the cislunar navigation exercise, Apollo 8, will return to its passive thermo control attitude. A bit earlier we performed - just prior to the G and N exercises, put one of our reaction control system quads into a cold soak briefly, the radiator OUT temperature transducer, reference transducer of course, being a piece of instrumentation equipment and we wanted to cross check with the crew, as to readings. As part of todays activities, there is a period of television, this scheduled in our prior flight plan at 128 hours ground elapsed time. We have just received a further weather update for our landing area. The weather conditions in the planned landing area, this about 900 miles southwest of Honolulu, are expected to be satisfactory at landing time Friday morning, weather conditions expected are partly cloudy to cloudy skies moderate winds, seas about 4 feet and the temperature near 82 degrees. Scattered showers are also forecast for this area, which may lower ceilings to near 2000 feet and visibility 25 miles. We've had, while we where talking here, a brief further conversation with Apollo 8 and we are going to pick up on that.
SC Houston, Apollo 8, over.
CAPCOM Apollo 8, Houston, GO. Apollo 8, Houston, GO.
SC Roger, about this radiator OUT temperature does your telemetry show that it happened all of a sudden.
CAPCOM That is affirmative.
SC Okay, I'm on malfuction 23, step 2, it looks to me like there is a small possibility we might be boiling, but I doubt it, so, you just want to hop over to step 4 and consider that a closed case.
CAPCOM Roger, we consider it closed.
PAO That was our final exchange with Apollo 8, the conversation with Bill Anders and at 120 hours 24 minutes, we will continue to monitor. This is Apollo control, Houston

END OF TAPE

PAO This is Apollo Control Houston at 120 hours 43 minutes into the flight of Apollo 8. Apollo 8, at the present time, 121,351 nautical miles away from earth. Current velocity of the spacecraft is 5302 feet per second and accelerating. As we pick up the Apollo 8 crew, we find during the conversation that spacecraft commander Frank Borman is interested in Apollo 8 final television appearance shceduled for this after noon, the final appearance prior to return to earth. We will pick up the conversation now.

CAPCOM Apollo 8, Houston.

SC Go ahead, Houston.

CAPCOM Roger. Frank, all of your primary loop temperature readings look just fine. Your evap in temperatures are normal and indicate you are getting normal mixing.

SC Okay, thank you.

CAPCOM Apollo 8, Houston.

SC Go ahead, Houston, Apollo 8.

CAPCOM Roger. For the P-23 attitude that you are in right now, your quad tank temperatures are better than we expected, but we are still monitoring and it's looking good.

SC Thank you. After we complete this, do you want us to return to the PPCS2, is that correct?

CAPCOM That is affirmative, Frank.

SC Would you have someone get up the gimbal angles for us to point the X-axis at the earth at the TV time, please.

CAPCOM Willco.

SC Also, Jerry, I would like to know our range and velocity at that time.

CAPCOM Roger, Frank. You want the range and velocity at TV time.

SC Right.

CAPCOM Apollo 8, Houston.

SC Go ahead, Houston, Apollo 8.

CAPCOM Roger. At 128 hours your altitude is 97,413, your velocity is --

SC Stand by just a minute.

CAPCOM Okay.

SC AT 128 hours you say?

CAPCOM Roger, that's TV time. Your altitude is 97,413, velocity is 6,072. Roll is 1 degree, pitch is 58, yaw 0.

SC Thank you.

CAPCOM You are welcome.

CAPCOM I just got a newspaper, Frank. I will go through it and pick out the news items for you.

SC Good, that will be great. We are just eating breakfast.

CAPCOM How are you having your eggs this morning?

SC Bacon, all except Lovell. He is having eggs Benedict.

CAPCOM It figures.

SC That Timbercove crew, you know they -

CAPCOM That's the gourmet crowd.

SC Jerry, I'm doing these P-23's, we were just about over Africa most of the time, at least it was in view. Nice weather over there this time of year.

CAPCOM Roger. You want to go down there?

SC Too hot.

SC Jerry, Jim Lovell just checked the P-30, rather the P-21 and you are right, 97, --

CAPCOM Roger, thank you, Jim. We ought to have these computers flight qualified in another couple of missions.

SC Yeah.

SC Houston, Apollo 8.

CAPCOM Apollo 8, Houston, go.

SC Roger. Was FCC 6 determined for exactly 122 hours, when you came up with that 6/10ths of a foot per second?

CAPCOM Roger. Jim, at exactly 122 we were figuring .5.

SC Roger. I'll try it again now at the same time using the P-37 with MA. The last time we did it before the last sightings, I got 2 feet per second. I'll see what I come up with this time.

CAPCOM Roger.

PAO This is Apollo Control Houston. We repeat those altitude and velocity numbers, at 128 hours ground elapsed time, that time for the final television transmission for Apollo 8 prior to return. At that time, the altitude is to be 97,413 nautical miles, velocity 6,072 feet per second. As you heard, we do expect some news items to be passed on to the crew shortly. At 121 hours 48 minutes into the flight of Apollo 8, this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control Houston, at 120 hours, 3 minutes into the flight of Apollo 8. The Apollo 8 spacecraft, at present 120 309 nautical miles away from Earth. Its present velocity is 5331 feet per second. We received a status report from the crew and Capsule Communicator, Jerry Carr, a sometimes newscaster here in Mission Control, passed alone the news to Apollo 8. We will pick up at this point.

CAPCOM Apollo 8, Houston.

CAPCOM Apollo 8, Houston, over.

SC Go ahead Houston, Apollo 8.

CAPCOM Apollo 8, this is Houston. We are ready for you to start your waste water dump anytime now. Could we have a crew status report?

SC You may, we had a good night sleep. Everyone slept at least 7 hours yesterday, and we have just finished breakfast, drunk alot of water, and I think we are in very good shape. Just used the exerciser.

CAPCOM Roger, Frank. Are you ready for some morning news?

SC Yes.

CAPCOM Okay, there is really not a whole lot in the news this morning, things are kind of quiet. I guess the biggest news is the accident rate, the Holiday deaths, which is certainly not very pleasent news; but we had 233 people killed nationally and 9 of them were in Houston on Christmas Eve, and Christmas. In the world news, the families made the news again. This is Associated Press, "The families of Apollo 8 crew sent a Christmas message to Navy Commander Lloyd Bucher, Captain of the USS PUELBO crew, released this week by North Korea. The message, addressed to Commander and Mrs. Bucher, at San Diego Navy hospital read 'You are in our thoughts and in our prayers. Your reunion has brought great joy into out heart this Christmas day. Our best to you personally and to all of the families under your command'. And it was signed "Families of the crew of Apollo 8." Space official said that the message had been suggested and written by Mrs. Frank Borman.

SC Thank you.

CAPCOM Let me see, elsewhere in the National News, the newly weds, David and Julie Eisenhower, came away from their secret honeymoon hideaway to have Christmas dinner with President-elect Nixon and the family. In New York city, the world's busiest harbor was reduced to almost complete inactivity Christmas Day, due to a 5-day old long shoreman strike and a rare quietus in shipping schedule. No ships arrived or left the harbor. Ferrys running on reduced Holiday schedule, provided the only marine activity. Here is an interesting little feature item that is kind of good to here. It seems that up in Ann Arbor, Michigan, they have

CAPCOM a new youth gang. It's called the Gilnet gang, that roams the streets of Ann Arbor, acting in secret and sometimes bypassing the law. They call themselves the gorillas for good. Some of the things they have done is, painted a bridge that was covered with obscenities. They painted it one night. A condemed house with - it's popular with neighborhood children, but dangerous, was boarded up. Downtown planters ... because of a debate over which group was responsible, business or government, were filled with flowers. A hedge thought to be hampering vision, at at busy intersection was trimmed and the owner was angered. Trash along a portion of the Uron River was picked up. Members of the gang are anonymous teenagers who ask for no individual recognition. Their aim is to slice red tape, to get good things in their opinion done. The organization has a faint religious overtone, it's sort of an ecumenical group, said an assistant professor at the University of Michigan who acts as an informal sounding board for the gang's ideas. The name is from St. Peter, the Fishermans Net. And it is remote enough not to be identified with any particular church. There is a threat of Robin Hood running through this thing, said their teacher, who also prefers to remain anonymous. A lot of their activities are extra legal. When the system bogs down, they directly administer good, rather than go through the red tape channel. The gang is made up of about 55 high-school kids, boys and girls, and there's another 40 or 50 who belonged to the gang before they graduated. The idea for the gang evolved from a trip to Detroit slum area, where a church group - youth group noted the way the street gangs operate. They were impressed with the methods of operation and decided to organize for somewhat different reasons, "with the chance to do things for the pure sake of giving," said the gang's advisor. That is about it as far as the world and national news and the features are concerned. On the sport page, Hank Stram of the Kansas City Chiefs was named as the AFL coach of the year. This is the second time for him in three seasons. The voting was done by an Associated Press panel of 30 sports writers and 30 sportscasters, three from each city. The nearest one to him was Weeb Ewbank. Other coach's that received votes were Sid Gilman of San Diego, and Lou Sabin of Denver. As for the Shriners College All Star game yesterday, the North cooled the South 3 to 0. Michigan State's Dick Berlinsky booted a 23 yard field goal in the first quarter and it was all the North needed to beat the South Wednesday, in the Shriners College All Star football game. Let's see, I guess the interesting things about this are first downs, North 19, South 16; rushing, North 214, South 169; passing was North 96, South 109. So, all in all, it looks like they were evenly matched. Looks like Parseghian

CAPCOM and his Notre Damers weren't as strong as ole Howard was worrying about.

SC Roger, and we are dumping the water now, Jerry.

CAPCOM Okay, Frank.

CAPCOM For the big Astro Blue Bonnet game, the big basketball clasic followed by the Astro Blue Bonnet Bowl in the Dome. SMU and Oklahoma haved arrived. They are getting ready for the big game. It doesn't say here which are favored. I will look that up and let you know later, if one is favored. The Davis Cup is underway now, down in Australia, and the US is bidding to recapture that again, and were favored to recapture the supremecy today. Another item in the news, is O. J. Simpson, he was named player of the year in college football for the second consecutive season by the Walter Camp football foundation. Woody Hayes, as I told you yesterday, was named coach of the year.

SC Roger.

CAPCOM Well, I guess that is about it Frank.

SC Thank you Jerry, I appreciate that. Jerry, this is Jim, we detour on that midcourse section two-tenths of a foot per second, is what we get.

CAPCOM Real fine, Jim. Do you just want to turn off your radios and come back without them.

SC No, we can't readout the (garble) erasable memory if we have to go into program one again.

SC I'd tried to get us back on the launch pad a little bit earlier.

CAPCOM Frank, one other little item in the news here, I thought might be interesting, standby.

CAPCOM Apollo 8, Houston.

SC Go ahead, you are loud and clear.

CAPCOM Okay, I got interrupted there for a minute. Bob Hope is back out in Viet Nam again with his troups, doing a great job as usual. One little name in the news story here is from the USS NEW JERSEY. Bob Hope joked from atop of the hugh gun turret yesterday, or Wednesday, to delight the 1500 men aboard the battle ship NEW JERSEY on its 20th Christmas entertaining US troops abroad. Hope and his 27 member troop entertained the NEW JERSEY seamen after attending a Christmas mass aboard the carrier HANCOCK, both off Viet Nam. This must be the biggest Chris Craft in the world, Hope told the seamen. It looks like Wake Island with a rudder. I think it was nice of them to take the ship out of mothballs just to give me a 21 gun salute, he said. Hope joked while standing on one of the ships 16 inch gun turrets. The sailors were particular impressed.

END OF TAPE

CAPCOM The sailors were particularly impressed by a squad of long legged girls who came aboard with Hope including Actress Ann-Margaret and Miss World.

SC Did you say that was his 20th trip over there at Christmas time, or overseas at Christmas time?

CAPCOM That's right, it's the 20th time he has been overseas for Christmas with the troops.

SC He's as old as Jack Benny.

CAPCOM Roger. Hey, you can turn off the water now.

SC We're in the process, or as we say in the aerospace business, that's in work.

CAPCOM Roger, you do good work. That other aviator that's going around the world, Max Conrad with his light plane, he spent Christmas Day in the antarctics at Puento Aranes in Chili. He's waiting for good weather so he can coninue his flight down to the South Pole. He hopes to get around the world. He is going around both Poles, and he's going to fly from Palmer to Byrd, from Byrd to the South Pole, and then return home to the United States by way of New Zealand, Australia, and Hawaii.

SC Brother, he had better take some no doze with him.

SC I tried to talk Frank into the same trip.

SC You can give him a weather report from Apollo 8. The South Pole was really clobbered, at least it was the other day.

CAPCOM Roger. I don't imagine there are many alternates down there.

SC No, I don't think so.

SC WE have some pretty clear weather up here.

CAPCOM No fog, huh?

SC Not outside.

SC Actually, it's snowing outside right now with that waste water dump that Bill just did.

CAPCOM Roger. Does it look a little bit like Christmas?

SC Right. Jerry, do you have a decision about what we are going to do about this next mid-course?

CAPCOM No Frank, we don't need it.

SC Okay, I just wanted to make sure of the first wave fuel, you will Scrub MCC 6?

CAPCOM Affirmative.

SC I guess - Jim said that was already official. I was sleeping at the time, I didn't hear it.

CAPCOM Okay. Frank, by the way, how do you feel about your EMF now? You feel like you've got all the

CAPCOM answers to the little funnies you saw earlier?

SC Yes, the answer is don't turn it into AUTO fast. It seems to be very sensitive to jerks, or separation.

CAPCOM Okay, you, you figure it's all pretty much just a switch throwing anomaly in it? If you play it by the numbers and slow and deliberate you will be okay?

SC Yes, I'm getting razzed up here because I said it was sensitive to jerks.

CAPCOM We thought of that, too, down here.

SC Yes, I figured you did. I told Ken last night at separation after TLI, when we separated from the S-IVB, we got a nice bang out of the pyros and the EMS jumped over 100 feet per second. Jerry, do you want to - I've got it in the flight plan to start charging our battery B. Do you want that started at 100 now also?

CAPCOM Affirmative, Frank.

SC Okay.

CAPCOM Frank, we expect it will take about 3 or 4 hours.

SC We're starting it.

CAPCOM Okay.

SC And we're happy to report the Earth is getting larger.

CAPCOM Roger, that's comforting. Looks like you are going to make Earth instead of Venus, huh?

SC Right.

CAPCOM Apollo 8, Houston. Your friendly guidance officer has got a LM vector update for you and a CMC time update. Over.

SC Okay, we'll go to 02. 02 in ACCEPT.

CAPCOM Roger.

PAO Apollo Control Houston. You heard Apollo 8 crew in extremely good spirits this morning. We have a well rested Apollo 8 crew. The status report indicated that each crewmember had about 7 hours sleep, breakfast complete, the water dump in progress while you listened, and then completed. Jim Lovell confirmed that onboard numbers for midcourse corrections coincided very closely with those on the ground, and at 121 hours 18 minutes into the flight of Apollo 8, continuing to monitor, this is Apollo Control, Houston.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/26/68, GET12140, 836a, 369/1

PAO This is Apollo control, Houston, at 121 hours 41 minutes into the flight of Apollo 8. Apollo 8 altitude above Earth, at this time 118 346 nautical miles. Present velocity reads 5387 feet per second. We have had only a brief conversational exchange with Apollo 8, since our last report, but we will play that for you now.

CAPCOM Apollo 8, this is Houston, the update is complete, the computer is yours, you can go to Mark.

SC Houston, we won't transfer that state vector, since we are not going to do that MCC, is that all right.

CAPCOM Okay, real fine, Frank.

SC Houston, Apollo 8.

CAPCOM Apollo 8, Houston, GO.

SC We are proceeding with the chlorination.

CAPCOM Roger.

PAO This is Apollo control, Houston, the MCC referred to was on the course correction, number 6 and we will reaffirm again that this midcourse correction is no longer required for the flight plan and at 121 hours 42 minutes, continuing to monitor, this is Apollo control, Houston.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/26/68, GET12212, 903a, 370/1

PAO Apoll8, altitude at the present time 116 650 nautical miles above the Earth. Present velocity reads 5436 feet per second. We have had only an abbreviated contact with Apollo 8 since our last report. This requesting a biomedical switch and we will play that now.

CAPCOM Apollo 8, Houston, biomed switch to center please.

SC 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, MARK.

CAPCOM Roger.

PAO Apollo control, Houston, that is it and so at 122 hours 14 minutes into the flight, continuing to monitor.

END OF TAPE

APOLLO 8 MISSION COMMENTARY, 12/26/68, GET12247, 937a, 371/1

PAO This is Apollo control, Houston, at 122 hours 47 minutes into the flight of Apollo 8. Apollo 8 altitude above the Earth at the present time 114 904 nautical miles. Its present velocity as it is coming back to Earth, 5487 feet per second. Here is a replay of the last conversation that we have had with the Apollo 8.

SC Houston, Apollo 8, how do you read?

CAPCOM Apollo 8, Houston, loud and clear.

SC Okay, thank you, we are starting the P23.

CAPCOM Roger, thank you, Frank. Apollo 8, Houston.

SC Go ahead.

CAPCOM Apollo 8, this is Houston, we have lost all C and C data on you. The last data we had showed a high and middle gimbal line in the lower.

SC That is fine, how come you lost those C and C data.

CAPCOM I think maybe it was just your movement - movement out of PPC.

SC I see, Mike. Thank you, It was high, I was watching it though.

CAPCOM Okay, we have data now.

PAO Apollo control, Houston, and as you heard, this reading on the middle gimbal angle explained by maneuvering from the spacecraft from a passive thermal control attitude to an attitude for the star sighting that navigation the program 23 and so at 122 hours 48 minutes into the flight, this is Apollo control, Houston.

END OF TAPE

PAO This is Apollo control, Houston, at 123 hours 20 minutes into the flight of Apollo 8. Apollo 8 now 113 087 nautical miles away from Earth, continuing on its trip home. Its present velocity 5542 feet per second. We have had some conversation with Apollo 8 which we will play now.

CAPCOM Apollo 8, Houston.

SC We are noticing our Quad A helium tank is starting to go up again. You got any ideas on that.

CAPCOM Yea, we are watching it too, Frank, so far it is still okay and we are talking about it.

SC Okay.

CAPCOM Apollo 8, Houston.

SC Go ahead.

CAPCOM Roger, Frank, this helium tank in Quad A it looks like we may have flattered you up unnecessarily on this think, it appears to be no problem as best we can tell. We got a few of the minds together talking about it and it has been down rated quite a bit. Also there - the folks down here monitoring the P23 suspect that Jim is shooting on star number 22 rather 02, so he may be having some problems.

SC I know, we have changed, we are on star 02 on the Moon.

CAPCOM Okay. Frank, I may have to add some names to my chicken list.

SC About what?

CAPCOM Helium tank A, Quad A.

SC Rog, I just don't want to be the one that proves the Fasher mechanics people are right.

CAPCOM Roger, Frank.

SC This attitude is going to have a slight burr under the hood too.

CAPCOM Roger.

PAO This is Apollo control, Houston, Jerry Carrs reference to the chicken list - this reference brought about on the Quad A temperature, it appears now that our tolerances are even better than we had previously thought. Since our last report we have talked with our retro fire officer here in mission control. Jerry Bostic who has passed along some preliminary entry numbers to us both assuming no midcourse correction at entry interface minus 2 hours or correction - midcourse correction at entry interface at minus 2 hours. We will pass along both sets of numbers and emphasis that they are preliminary, they are updated about every hour or so. Assuming no midcourse, we would be looking at a ground elapsed time of entry interface at 146 hours 46 minutes 18 seconds into the flight of

APOLLO 8 MISSION COMMENTARY, 12/26/68, GET12320, 1011a, 372/2

PAO Apollo 8, a velocity at time of entry interface 36221 feet per second, an entry angle of minus 6.31 degrees. Assuming a midcourse correction at entry interface minus 2 hours of about 2 feet per second Delta V we would look at a ground elapsed time of entry interface of 146 hours 46 minutes 14 seconds, with a velocity at the time of entry interface of 36221 feet per second, our entry angle for this mod would be minus 6.51 degrees, so at 123 hours 25 minutes into the flight of Apollo 8, this is Apollo control, Houston.

END OF TAPE

PAO This is Apollo Control Houston at 123 hours 33 minutes into the flight of Apollo 8. Apollo 8's altitude at this time above the earth 112 413 nautical miles. Our current velocity 5563 feet per second. Through Capsule Communicator Jerry Carr we've had a rather healthy exchange with Apollo 8 crew, and we'll play that now.

CAPCOM Apollo 8 Houston, we are going to need some data from your past P23 marks. We missed some items, so don't put it away and when you finish this next P23 we'll get it all together.

SC Okay.

CAPCOM Roger, got some information for you on this PTC that we'll be going to right after this next P23 exercise. We will like you this time to try the nose north attitude at pitch of 180, and a yaw of 315, and also we'd like to give another look at this load free type of PTC and we think maybe we'll get a little bit of ... stabilization if we try it at .3 degrees per second on the roll rate rather than .1, so if you figure on doing that at 12430 we'll see what kind of information we get out of it.

SC Okay, you know what I think of that, don't you? I'll be happy to do it, but I think it's playing games.

CAPCOM Roger Frank, you're burning right now 1.4 pounds per hour with attitude hold in Pitch and Yaw. We're kind of interested to see if .3 degrees per second will reduce your RCS usage due to ... stabilization.

SC Yes, I know, I predict that it will not.

CAPCOM Okay.

SC Jerry, I'm a little concerned about the temperature. We're getting kind of warm in here and also the evaporator outlet temperature is up around 45 degrees. Do you have any transits for getting less efficient operation of the radiators?

CAPCOM Frank, E Comm says everything looks nominal down here. You might try a change in your cabin temperature heat exchanger, huh?

SC No, we don't have the fans on, but what we have done is put up a window shade. That seems to help it. We've been getting a lot more sun in the cabin this morning.

CAPCOM Roger, We'll keep a sharp eye on things and keep you posted.

SC Roger. I don't mind playing games cause you guys have been very nice in the 5 and a half days. If you want to play games in the next half hour we'll play.

CAPCOM Roger Frank.

SC Jim is trying this ... with the ...

SC optics so we can give you a transmission on that.

CAPCOM Okay.

SC I think it would be very difficult to extrapolate anything that you are getting out of this bit business to a LM command module combination, because the spacecraft handles quite a bit different just with the change of fuel load, including the difference in drifting off and roll.

CAPCOM Roger, Frank, we just got finished discussing that, too. We agree with your point of view on that one. I think this is more of a curiosity thing than anything at all.

SC I think it's fine, no sweat. We don't have anything else to do here for about another 10 hours.

CAPCOM Okay.

SC Jerry, what I'm kind of curious about is the fuel usage now with P23 and what we were doing we have a lot more fuel.

CAPCOM Jim, we'll take a look at that fuel usage bit. Right now the trend looks like it is getting better as we would expect with a lighter weight. We'll try to get a little more definitive for you.

SC We really - we shouldn't complain about the fuel usage on that SPS engine though, cause we're sure getting a lot of miles per gallon on it.

CAPCOM Roger Frank. Frank, we'll enter you in the Shell Road Test on that.

SC Yes, we don't have any TCP in it, or what is that, TCP? Yes. That's the problem, if we'd had that we would have probably used only half the fuel.

CAPCOM Oh, you mean Platformate?

SC That's right, platformate. If you will get the people to spread out one of those banners around the target area we'll try to break it, you know, and coast through it.

CAPCOM Okay, we'll call some of the paper companies and see if they can find a roll big enough.

SC It won't take a big roll, just about 30 feet.

CAPCOM Roger.

SC Onboard Nav.

SC Tell the doctors that we put William to sleep.

CAPCOM Roger. You won't leave any scars will you?

SC No, he's got his tape recorder with him. Bill said to call Valarie and have her to rewind the tape recorder - the tape recorder at home.

CAPCOM Apollo 8, Houston.
SC Go ahead.
CAPCOM I hate to tell you this Frank, because Jim probably won't even be able to wear his comm carrier anymore, but that last set of marks put your state vector right on top of the News Center state vector.
SC Come off that, Jerry, come on, you promised.
SC I'll get you that bottle of Brandy when I get home, Jerry.
SC Maybe we can get him to go to program 01 again today, too.
CAPCOM Roger, that sounds good.
CAPCOM Apollo 8, Houston. Also on the flight plan for 12430 we would like for you to run an 02 purge on the fuel cells.
SC Okay.
SC Hey, Jerry, we were going over the checklist on entry here, you know?
CAPCOM Roger, Frank.
SC I've got a question. Is John Harpold around?
CAPCOM Roger, he is listening.
SC John, I can't remember, is the list vector up end now, or -
SC Jerry, I'm beginning to worry up here.
CAPCOM Roger, it depends on which way your nose is pointing.
SC I appreciate. You might note for the people at MIT that the next series of stars will be shot by the master navigator with a space helmet on, and long eye remains ...
CAPCOM Roger. That ought to cut his speed down a little bit.
SC Right.
CAPCOM Frank, while you are talking about the entry checklist, this cold soak. Have you decided exactly where you want to do it there prior to entry?
SC Well, I understood that E Comm talked that over with Bill, and we do it 1 hour prior to entry. We'll do it where ever you say is the best.
CAPCOM Okay, 1 hour is fine, it's just a matter of finding time in the time line to do it.
SC I think we can initiate it 1 hour before that.
CAPCOM Okay, fine, sounds like a winner.
SC Really got a 11 zeroes with that helmet on.
CAPCOM Roger, we had noticed that.